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For U.S. Mail
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John King, Acting Secretary of Education
Ann Whalen, Senior Advisor to the Secretary, Delegated Duties of the Assistant Secretary
Patrick Rooney, Acting Director, Office of State Support

United States Department of Education
Office of Elementary and Secondary Education
400 Maryland Ave., SW
Washington, DC 20202

January 21, 2016

Dear Secretary of Education John King, Ms. Whalen, and Mr. Rooney,

We recommend for your ESSA review team to take action on the health and safety issues of wireless technology. We applaud and support efforts to see that schools employ the most up-to-date educational technologies with high-speed Internet access. The use of wired systems to provide this access is to be preferred because of speed, access, and safety issues that we outline here. We are part of a growing number of scientists who are deeply concerned about the growing scientific evidence that wireless networks may pose serious health threats, particularly for children, pregnant women, and people with an underlying illness.

A number of countries around the world have already taken steps to reduce the levels of radio-frequency (RF) radiation in schools. Early in 2015, France passed a national law banning wifi from nursery schools and mandating that schools turn off wifi whenever it is not in use, to minimize RF radiation exposures onto the children. Israel established a new national institute to review scientific evidence and recommends wired computers for teachers and minimized wifi exposures in student classes. Government agencies in Russia, India, Australia, and Belgium also advise that children's wireless exposures be minimized and that citizens take specific precautions with children's use of cellphones and all wireless devices. In fact, [over 20 countries](#) have taken a precautionary approach on the issue of wireless devices, which were not tested for long-term use by children prior to the devices being introduced into schools.

Environmental Health Trust scientists would like to work with you in developing safer technology use practices that incorporate the latest scientific and technical information from neurologists, pediatricians, and electrical engineers. At your convenience, we would like to brief you and your senior staff regarding the health risks of microwave RF radiation emitted by wireless technologies and prudent policies that can easily reduce wireless exposures throughout the American educational system *without compromising our capacity to impart technology training*.

Current exposure standards for RF radiation were set nearly 30 years ago to avoid heat. In fact, studies show that RF radiation exposures from currently used cellphones that do not induce heat can damage the nervous system, impair sleep, hearing and reproductive health, and increase the risk of cancer. Wireless devices that manufacturers test at a distance of more than 8 inches from the body and are intended to be employed on tables are being closely held next to growing young bodies in schools around this nation—creating exposures far in excess of as-tested levels.

The United States has come under sharp criticism by the [GAO](#), the [American Academy of Pediatrics](#), the [US Department of the Interior](#), and research scientists from around the world for relying on outdated standards. The Federal Communications Commission (FCC) is currently reviewing exposure standards and has received hundreds of submissions detailing public health concerns regarding the current regulations ([Proceeding 13-84](#), 2013).

In 2013, the [American Academy of Pediatrics wrote to the FCC](#) calling for more protective RF radiation exposure standards and stated, “Children are not little adults and are disproportionately impacted by all environmental exposures, including cellphone radiation. Current FCC standards do not account for the unique vulnerability and use patterns specific to pregnant women and children.”

Yale University Chairman of Obstetrics/Gynecology, Hugh Taylor MD PhD, works with physicians and experts in developmental biology as part of the [BabySafe Project](#) creating materials for health professionals and pregnant women in order to promote awareness of the need to reduce exposures to cellphones and other sources of wireless radiation. Attesting to the seriousness of the health risks, Professor Martha Herbert, MD PhD, a Harvard pediatric neurologist, [testified before the Canadian Parliamentary Health Committee](#), stating that, “RF Radiation from wifi and cell towers can exert a disorganizing effect on the ability to learn and remember, and can also be destabilizing to immune and metabolic function.”

Regarding the evidence on the damaging impact of wireless radiation, the range of impacts is growing. RF radiation also has been shown to impair immune system function, as well as impact gene and protein expression, cell signaling, oxidative stress, cell death, the blood-brain barrier, and brain activity. Please consider this recently published scientific information.

- The World Health Organization’s International Agency for Research on Cancer (IARC) classifies RF radiation as a Class 2B Carcinogen, a possible human carcinogen. The IARC issued their [Monograph](#) in April 2013 detailing the basis of the classification. Note that other 2B carcinogens such as lead and DDT are subject to serious regulatory control and restriction on school properties.
- Written by Yale University Senior Faculty, Environment and Human Health Inc. released “[Cell Phones: Technology, Exposures, Health Effects](#)” in 2011 calling for reduced exposures and more stringent protective standards.
- A [recently published research review](#) reports that 93% of 100 peer reviewed studies on the oxidative effects of low-intensity (below the ICNIRP limits) microwave radiation confirmed that RF radiation induces oxidative effects in biological systems. The authors state that this oxidative stress should be recognized as one of the primary mechanisms of the biological activity of this type of radiation, and they recommend “minimizing the intensity and time of RFR exposures, and taking a precautionary approach towards wireless technologies in everyday human life.” Oxidative stress is implicated in the cause of many diseases such as cancer and Alzheimer’s disease. (Yakymenko et al. 2015)
- In May 2015, over 200 scientists who have authored more than 2,000 articles on this topic appealed to the United Nations to address the emerging public health crisis related to cellphones

and other wireless devices, urging that the United Nations Environmental Programme (UNEP) initiate an assessment of alternatives to current exposure standards and practices that could substantially lower human exposures to non-ionizing radiation. Please see their website at <https://emfscientist.org>

- Several studies have found that wireless radiation can damage both the male and female reproductive systems: Adams (2014), Avendaño et al. (2012), De Iuliis et al. (2009), Fejes et al. (2005), Agarwal et al. (2008), Wdowiak et al. (2007), Gul et al. (2009), Atasoy et al. (2013), Nazıroğlu et al. (2013), Panagopoulos (2012), and Gutschi et al. (2011).
- Several studies also indicate important changes in brain activity and neurotoxic effects: Aldad et al. (2012), Cetin et al. (2014), Júnior et al. (2014), Odaci et al. (2008), Qiao et al. (2014), Bas et al. (2009), Nazıroğlu and Gumral (2009), Megha et al. (2012), Bin et al. (2013), Jing et al. (2012), Razavinasab et al. (2014), Volkow et al. (2011), and İkinci et al. (2013).
- [Published case studies](#) by breast cancer surgeons found a link to unusual breast tumors in young women who keep cellphones in their bras and have no genetic markers for the disease: West et al. (2013). Please watch [a recent lecture](#) on this issue by Dr. Lisa Bailey, MD, breast surgeon, and former President of the American Cancer Society in California.

As the technology is so new and changing so rapidly in its use, few of those currently in leadership positions are familiar with the growing information developed by the bioelectromagnetics research community. We are aware that school administrators, staff, and students are not fully aware of the health and safety issues wireless devices present. For example, iPads and tablets have at least 4 antennas each emitting digital pulsed RF radiation. Operating systems include [fine print warnings](#) instructing that the cellular antennas be directed “away from the body and other objects,” so that RF radiation exposures do not exceed the as-tested FCC limits. In fact, *all* wireless devices have [specific instructions](#) to keep a distance from the device.

Recognizing these facts, in 2014, the US-Collaborative for High Performance Schools adopted new criteria for safe and healthy schools, including Low-EMF building code criteria such as wired local area networks for computers and phones. Attached is a document detailing their Low-EMF criteria as well as a document detailing [current precautionary actions](#) taken by governments and authorities around the world.

Based on the accumulated scientific evidence showing biological effects, and precautionary policies devised by other nations, we recommend that the U.S. Department of Education do the following:

1. **Raise school community awareness through new educational curriculum:** Students, teachers, and their families should be given information on wireless health risks and simple precautionary steps they can take to protect their health. It is important to teach children how to use technology both safely and more responsibly in order to protect their health and wellbeing.
2. **Install a safe communication and information technology infrastructure in schools to meet educational needs:** Solutions exist to reduce exposures to wireless emissions and

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mitigate the health risk. Low-EMF Best Practices have been developed allowing educational needs to be met with safer hard-wired Internet connections, which are also faster and more secure.

Schools have a unique opportunity to maintain low-radiation environments through prudent technology choices and Low-EMF Best Practices, thus significantly reducing children's overall lifetime exposures. We applaud [the efforts of the Ashland School District](#)—and [the advice of the Israeli government](#)—that wired computers are preferred in all instances and that exposures to wifi be eliminated from the environments of infants and toddlers and generally reduced in children's environments overall.

Considering that no research documents long-term exposure to low-intensity microwave radiation as safe for children, *the best approach is precautionary.*

A 21st century classroom must bridge the digital divide so that students have equal access to technology. Low-EMF Best Practices are the solution that allows for full communication, information access, and learning tools use in the classroom while minimizing unnecessary health risks. With your leadership, the United States of America can thoughtfully integrate safe technology into every classroom while responsibly safeguarding the health of every generation. We look forward to working with you on this important issue.

Sincerely,

A handwritten signature in black ink that reads "Devra Davis".

Devra Davis, PhD MPH
President and Founder
Environmental Health Trust
Visiting Professor Hebrew University Hadassah Medical Center

Signing on behalf of the following:

Beatrice Alexandra Golomb, MD PhD
Professor of Medicine
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Selected References

- Adams J, Galloway T, Mondal D, Esteves S, Mathews F. (2014). [Effect of mobile telephones on sperm quality: A systematic review and meta-analysis](#). *Environment International*. 80, 106-112.
- Aldad T, Gan G, Gao X, Taylor H. (2012). [Fetal Radiofrequency Radiation Exposure From 800-1900 Mhz-Rated Cellular Telephones Affects Neurodevelopment and Behavior in Mice](#). *Scientific Reports*.
- Agarwal A, Deepinder F, Sharma R, Ranga G. (2008). [Effect of cell phone usage on semen analysis in men attending infertility clinic: an observational study](#). *Fertil Steril*. 89(1), 124-8.
- Atasoy H, Gunal M, Atasoy P, Elgun S, Bugdayci G. (2013). [Immunohistopathologic demonstration of deleterious effects on growing rat testes of radiofrequency waves emitted from conventional Wi-Fi devices](#). *Journal of Pediatric Urology*. 9(2), 223-9.
- Avendaño C, Mata A, Sanchez C, Doncel G. (2012). [Use of laptop computers connected to internet through Wi-Fi decreases human sperm motility and increases sperm DNA fragmentation](#). *Fertility and Sterility*. 97(1), 39-45.
- Bas O, Odaci E, Mollaoglu H, Ucok K, Kaplan S. (2009). [Chronic prenatal exposure to the 900 megahertz electromagnetic field induces pyramidal cell loss in the hippocampus of newborn rats](#). *Toxicol. Ind. Health*. 25, 377-384.
- Cetin H, Naziroglu M, Celik O, Yuksel M, Pastaci N, Ozkaya MO. (2014). [Liver antioxidant stores protect the brain from electromagnetic radiation \(900 and 1800 MHz\)-induced oxidative stress in rats during pregnancy and the development of offspring](#). *J Matern Fetal Neonatal Med*.
- De Iuliis G, Newey R, King B, Aitken R. (2009). [Mobile phone radiation induces reactive oxygen species production and DNA damage in human spermatozoa in vitro](#). *PLoS One*. 4(7)
- Fejes I, Zavaczki Z, Sollosi J, Koloszar S, Daru J, Kovacs L, Pal A. (2005). [Is there a relationship between cell phone use and semen quality?](#). *Arch Androl*. 51(5), 385-93.
- Gul A1, Celebi H, Ugras S. (2009). [The effects of microwave emitted by cellular phones on ovarian follicles in rats](#). *Arch Gynecol Obstet*. 280(5), 729-33.
- Gutschi T, Mohamad Al-Ali B, Shamloul R, Pummer K, Trummer H. (2011). [Impact of cell phone use on men's semen parameters](#). *Andrologia*. 43(5), 312-6.
- Ikinci A, Odaci E, Kaya H, Akca M, Hanci H, Alsan A. (2013). [The Effects of Prenatal Exposure to a 900 Megahertz Electromagnetic Field on Hippocampus Morphology and Learning Behavior in Rat Pups](#). *NeuroQuantology*. 11(4), 582-590.
- Jing J, Yuhua Z, Rongping J, Xiao-qian Y, Dong-mei G, Xi C. (2012). [The influence of microwave radiation from cellular phone on fetal rat brain](#). *Electromagn Biol Med*. 31(1), 57-66.
- Lv B, Chen Z, Wu T, Shao Q, Yan D, Ma L, Lu K, Xie Y. (2013). [The alteration of spontaneous low frequency oscillations caused by acute electromagnetic fields exposure](#). *Clinical Neurophysiology*.
- Naziroglu M, Yuksel M, Kose SA, Ozkaya MO. (2013). [Recent reports of Wi-Fi and mobile phone-induced radiation on oxidative stress and reproductive signaling pathways in females and males](#). *J Membr Biol*. 246(12), 869-75.

Odaci E, Bas O, Kaplan S. (2008). [Effects of prenatal exposure to a 900 megahertz electromagnetic field on the dentate gyrus of rats: a stereological and histopathological study.](#) *Brain Res.* 1238, 224–229.

Panagopoulos DJ. (2012). [Effect of microwave exposure on the ovarian development of *Drosophila melanogaster*.](#) *Cell Biochem Biophys.* 63(2), 121-32.

Qiao S, Peng R, Yan H, Gao Y, Wang C, Wang S, Zou Y, Xu X, Zhao L, Dong J, Su Z, Feng X, Wang L, Hu X. [Reduction of Phosphorylated Synapsin I \(Ser-553\) Leads to Spatial Memory Impairment by Attenuating GABA Release after Microwave Exposure in Wistar Rats.](#) *PLoS One.* 17, 9(4).

Razavinasab M1, Moazzami K, Shabani M. (2014). [Maternal mobile phone exposure alters intrinsic electrophysiological properties of CA1 pyramidal neurons in rat offspring.](#) *Toxicol Ind Health.*

Volkow ND, Tomasi D, Wang GJ, Vaska P, Fowler JS, Telang F, Alexoff D, Logan J, Wong C. (2011). [Effects of cell phone radiofrequency signal exposure on brain glucose metabolism.](#) *JAMA.* 305(8), 808-13.

Wdowiak A, Wdowiak L, Wiktor H. (2007). [Evaluation of the effect of using mobile phones on male fertility.](#) *Ann Agric Environ Med.* 14(1), 169-72.

West JG, Kapoor NS, Liao S, Chen JW, Bailey L, Nagourney RA. (2013). [Multifocal Breast Cancer in Young Women with Prolonged Contact between Their Breasts and Their Cellular Phones.](#) *Case Reports in Medicine.* Volume 2013, Article ID 354682.

Igor Yakymenko, Olexandr Tsybulin, Evgeniy Sidorik, Diane Henshel, Olga Kyrylenko, and Sergiy Kyrylenko. (2015) [Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation.](#) *Electromagnetic Biology and Medicine.*